CAPTURING LIVE PERFORMANCE

BLACKBOX RECORDER

BBR64-MADI &

BBRDante

User Manual

V 2.2 rev 0

Date: July 2011

Congratulations on your purchase of the JoeCo BlackBox Recorder. This document will lead you through the basics of how to set up and use the product. The BlackBox Recorder (BBR) has been designed to be as simple as possible to set up and operate. Consequently you will find that this user manual is not a long document and can be read from cover to cover in a short while. However, we strongly recommend that you do read it just in case there are some aspects of the product that are not immediately obvious.

This manual covers the following variants of the BlackBox Recorder: BBR64-MADI and BBR-DANTE and should be read in conjunction with the Quick Start guide.

More information is available in the LOGIN area of the JoeCo Website www.joeco.co.uk . Visitors can gain immediate access to more detailed information whilst EndUsers once approved are eligible for software upgrades and other downloads.

If you need information in a hurry register as a Visitor and upgrade to an EndUser later on.

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Contents

BLACKBOX **RECORDER** 1
BBR64-MADI & BBRDante 1
Important Safety Information 3
WARNING - Read the following before proceeding : 3
Copyright Warning 4
Opening the box 5
Box Contents 5
Controls and interfaces 6
Front Panel 6
Rear Panel 7
Installation 9
Deciding where to install 9
Wiring the BBR into your console 9
Deciding on a disk drive 10
Connecting a disk drive 11
Power connection 12
Checking that everything works 12
Normal operation 13
Recording 13
Playback 14
File Names 15
Virtual Sound Checking 18
Monitoring 19
Summary of Combined Controls in MAIN Screen 20
Using the Menu 20
Menu Structure and operation 21
Setting up adjustable parameters 21
Software updates 30
Linking multiple BlackBox Recorders together 32
Safe'n'Sound Record Recovery 34
Using a PS2 keyboard 35
Troubleshooting 36
Summary Of Alert Messages 38
JoeCo Conditions of Use 40
Software Licence Agreement 42
Warranty Information 45
Product Returns 47
Product and End User Registration 48

Important Safety Information

WARNING - Read the following before proceeding :

Read instructions: Retain these safety and operating instructions for future reference. Adhere to all warnings printed here and on the equipment. Follow the operating instructions printed in this User Guide.

Do not remove covers: Operate the equipment with its covers correctly fitted. Refer any service work on the equipment to competent authorised technical personnel only.

Power sources: Connect the equipment using the mains power adapter supplied.

Power cord routing: Route power cords so that they are not likely to be walked on, stretched or pinched by items placed upon or against them.

Grounding: Do not defeat the grounding and polarisation means of the power cord adapter or plug. Do not remove or tamper with any ground connection in the power cord.

Water and moisture: To reduce the risk of fire or electric shock do not expose the equipment to rain or moisture or use it in damp or wet conditions. Do not place containers of liquid on it which might spill into any openings.

Ventilation: Do not obstruct any ventilation. If the equipment is to be operated in a flight-case ensure that it is constructed to allow adequate ventilation.

Heat and vibration: Do not locate the equipment in a place subject to excessive heat or direct sunlight as this could be a fire hazard. Locate the equipment away from any devices which produce heat or cause excessive vibration.

Servicing: Unplug the power immediately if the unit is exposed to moisture, spilled liquid, the power adapter becomes damaged, during lightening storms, or if smoke, odour or noise is noticed. Refer servicing to qualified technical personnel only.

Installation: Install the equipment in accordance with the instructions printed in this User Guide. Use the equipment connections for their intended purpose only.

Precautions

Environment: Protect from excessive dirt, dust, heat and vibration both when operating and storing. Avoid drinks spillage, tobacco ash, smoke, and exposure to rain and moisture. If the equipment becomes wet, remove power immediately. Allow to dry out thoroughly before using again.

Cleaning: Avoid the use of chemicals, abrasives or solvents. The equipment is best cleaned with a dry lint-free cloth. Do not remove the cover to clean the unit.

Damage: To prevent damage to the equipment cosmetics, avoid placing heavy objects on the unit, scratching the surface with sharp objects, or subjecting the unit to rough handling and vibration.
Transporting: The equipment should be transported in the original packing or purpose built flight case to protect it from damage during transit.
Cables: Plan the location of the equipment so that the connecting cables are not fully extended. Full extension of the cables can stress the equipment and cables and may result in undesired performance. Ensure that all cables are located such that they cannot be stood on or tripped over.

Copyright Warning

JoeCo's recorder products are designed to enable you to record and reproduce material to which you own the copyright, or material which the copyright owner has granted you permission to record and/or reproduce.

It is illegal to record, reproduce, distribute, sell, hire, lend, perform or broadcast all or part of a work (written or musical composition, broadcast, performance or similar) whose copyright is held by a third party without permission of that third party.

Do not use this Product for purposes that could infringe a copyright held by a third party. JoeCo and its authorised distributors and resellers assume no responsibility whatsoever with regard to any infringements of third-party copyrights arising through your use of this Product.

Opening the box

Box Contents

Inside the box you will find the following:

- BlackBox Recorder
- Power Supply
- User Manual
- Quick Start Guide

The BlackBox Recorder is not a standard multitrack recorder nor is it a digital audio workstation (DAW). It has been designed specifically for Live applications and will not necessarily be appropriate for use in a studio situation. It will typically be used to record audio material onto a USB2 drive for subsequent editing and processing in a DAW.

A number of specific features have been added to make it suitable and safe in a Live environment; playback lockout, protection against accidentally ending a recording, virtual sound checking, no general purpose operating system, etc.

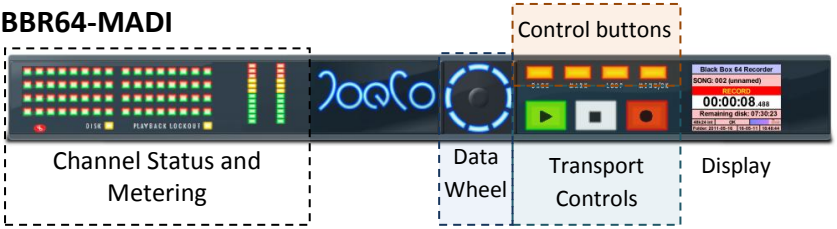
Some features often found in other multitrack machines are not present in the BlackBox Recorder such as overdubbing and punch in facilities.

Controls and interfaces

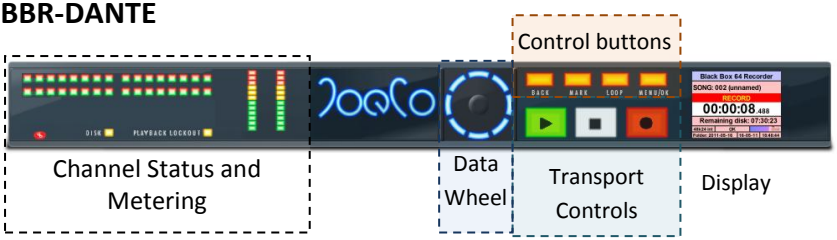
Front Panel

The front panel of the BlackBox Recorder contains all the user controls for the unit. The buttons are all touch sensitive which prevents them wearing out through constant use – just place the flat of your finger on the button to operate.

BBR64-MADI



BBR-DANTE



The left hand side of the unit contains the metering and channel status section. Each channel or Track [1 through 64on the MADI system] [1 through 32 on the Dante system] has a bicolour LED to indicate the track status (armed for recording; recording; rough level meter; ready for playback; Pre Fade Listen, etc.). To the right of this are two columns of metering LEDs comprised of Green, Yellow and Red LEDs. These metering LEDs show the levels on the Pre Fade Listen (PFL) bus inside the BlackBox Recorder. The monitoring section of this manual described the PFL function in more detail.

There are also indicators for Disk activity and Playback Lockout which can prevent you from accidentally entering playback during the performance.

To the right of the JoeCo logo is the control wheel which has a number of functions explained later in this manual.

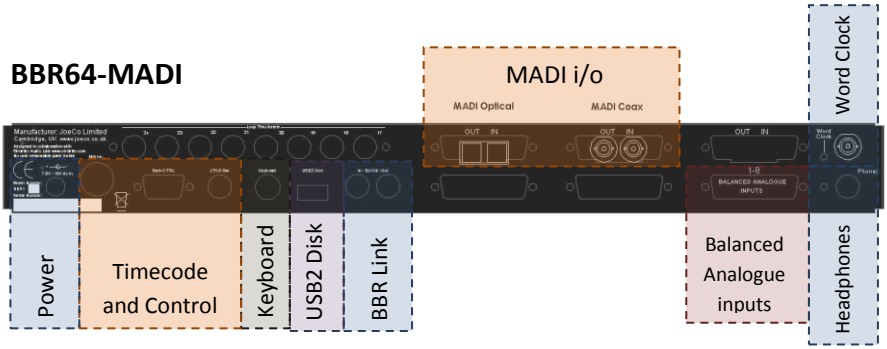
Then we have the main Transport controls [PLAY, STOP, RECORD] with the four other control buttons above [L-R: BACK, MARK, LOOP, MENU].

Finally, at the right hand side of the front panel is the colour LCD display.

Rear Panel

The rear panels of the BBR64-MADI and BBR-DANTE BlackBox Recorders are as follows: The areas indicated in the diagram below are explained in more detail later in this manual.

BBR64-MADI



Audio i/o on the BBR64-MADI utilises either optical or coaxial (BNC) connections and both variants are provided for, selectable in software (see above).

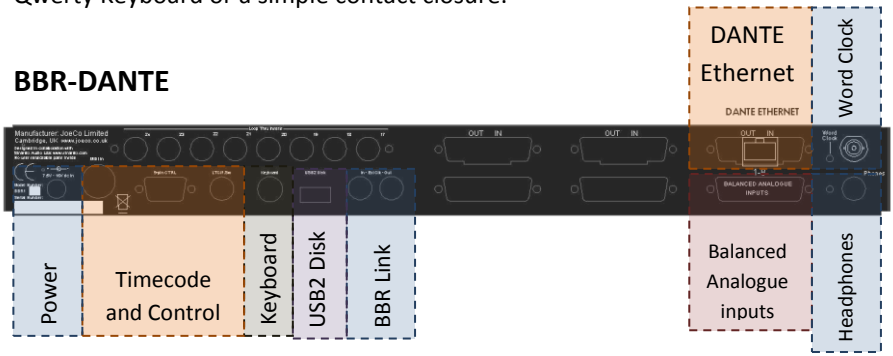
Audio Clocks may be extracted from the incoming MADI data stream, from the separate word clock input or from the BBR link RCA input (ext clk in).

The rightmost of the lower 3 D-type cut outs provides for an additional 8 channels of balanced analogue input .The cable loom should conform to the TASCAM standard for analogue i/o (pin out is available in the visitor section of the LogIn area of the JoeCo website www.joeco.co.uk).

A stereo TRS ¼" headphone socket provides the output of the Pre Fade Listen bus.

The power connector is a 4pin mini XLR connector. Linear Timecode (LTC) and MIDI Timecode (MTC) can be used to time stamp recordings. Remote Control can be via Sony PII protocol (9-pin), MIDI Machine Control (MMC), Qwerty Keyboard or a simple contact closure.

BBR-DANTE



Audio i/o on the BBR-DANTE utilises the Ethernet RJ45 connector and should be connected using high quality CAT5E Ethernet cable (see above).

Audio Clocks may be extracted from the incoming DANTE data stream, from the separate word clock input or from the BBR link RCA input (ext clk in).

The rightmost of the lower 3 D-type cut outs provide for an additional 8 channels of balanced analogue input .The cable loom should conform to the TASCAM standard for analogue i/o (pin out is available in the visitor section of the LogIn area of the JoeCo website www.joeco.co.uk).

A stereo TRS ¼" headphone socket provides the output of the Pre Fade Listen bus.

The power connector is a 4pin mini XLR connector. Linear Timecode (LTC) and MIDI Timecode (MTC) can be used to time stamp recordings. Remote Control can be via Sony PII protocol (9-pin), MIDI Machine Control (MMC), Qwerty Keyboard or a simple contact closure.

The rest of the rear panel is fairly self explanatory we hope and is explained in greater detail later in this manual. There are more technical details on the JoeCo website (www.joeco.co.uk) should you require them.

Installation

Deciding where to install

In a live situation, it depends on whether the live engineer wants to be able to see the BBR interface or not and whether you intend to utilise the Virtual Sound Check facilities. If possible, it's best to install it at eye level for ease of operating the menus.

Wiring the BBR into your console

When recording MADI, your choice of coaxial or optical SC cables will most likely be dictated by the console. The BBR64-MADI provides for both types so it's easy to plug in. Make sure you wire the console's output to the BBR's input and vice versa.

You will need to configure the sample rate to be the same as the rest of your system. Use the MENU button and then use the wheel to select SETUP; Press MENU again to enter the Setup menu and then use the wheel again to select SAMPLE RATE. Pressing MENU again will now allow you to use the wheel to select which sample rate to use and MENU again confirms your choice. The BACK button takes you back a MENU level.

To configure the input to the BlackBox, you will need to use MENU; INPUT/OUTPUT… to select the input source: [Electrical (Coax) or Optical]; select the Reference Clock: [MADI, Wordclock, SPDIF or Internal].

At the bottom of the INPUT MENU the Input Status bar turns green when the BBR is locking to a good, valid input signal; a yellow bar indicates that the BBR cannot lock to the incoming signal or that it has been instructed to lock to a clock signal that is not synchronous with the incoming data; a red bar shows that no input signal is being received.

The Output Setup screen similarly configures the output of the BlackBox.

If you're using a DANTE system then you'll have an appropriate CAT5 Ethernet cable to plug into the BlackBox Recorder. The CAT5 cable is

bidirectional and you'll need to use the Dante Controller software to configure the network connections.

In certain circumstances, you can supplement the digital inputs with up to 8 analogue inputs. This is primarily aimed at capturing the ambience of the venue or the audience itself. These additional 8 analogue inputs are balanced line level inputs and will normally be fed from separate microphone pre amps or spare channels on the console.

On a BBR64-MADI, these additional 8 analogue inputs are only available when the MADI input is set to receive 56-channel (legacy) MADI signals.

On a BBR-DANTE system these additional 8 analogue channels will always be available and you can decide whether to insert them into the outgoing Dante data stream or not. If you do want to access these channels elsewhere on the Dante network, insert them as channels 1-8, bumping all the other channels up.

The additional analogue inputs can be monitored on the internal PFL bus, two channels at a time

These balanced analogue inputs can be switched between **Low** and **Pro** levels in the Setup Menu (page 26).

Setting	**LOW**	**PRO**
Nominal level	-10dBu	+4dBu
Headroom above nominal level	14dB	18dB
0dBFS (when digital clipping will occur)	+4dBu	+22dBu

Pay special attention to the clocking signals to ensure that the BlackBox Recorder is being clocked correctly. There is more on this subject later, in the clocking section (page 23).

Deciding on a disk drive

Both the BlackBox MADI Recorder and the Dante Recorder require modern fast USB2 drives. We cannot guarantee that every drive in the world will

work but all the ones we've tried so far have done. The only criteria that you need to follow are:

- Up to 2TB with USB2 interface
- 7200rpm or 10,000rpm recommended
- Formatted with FAT32 Filing System

USB2 can carry up to 480Mbits/s of data and for recording 64 tracks of 48kHz/24bit the maximum data rate we need is around 80MBits/s so there's normally plenty of headroom. JoeCo has already tested numerous USB2 drives from Western Digital, Glyph, Seagate, Verbatim, Samsung, Buffalo and others and found them to work well. We chose the FAT32 filing system because it is compatible with all major Operating Systems and it's also the format chosen for the AES31 digital interchange standard.

However, USB powered drives (such as the Western Digital Passport series) typically draw more current than the USB2 specification allows (limited to 500mA) and can therefore not be used without providing a separate power supply. Most standard Flash RAM drives (aka Pen Drives) are not fast enough to take the full USB2 data rates that the BBR requires and even the 200X flash drives are too slow for recording 64 channels of 48k MADI data. If you are not sure, ask the supplier if you can try the drive with the BBR before you buy it. You must make sure that the drive you are using is fast enough and not too fragmented before you use it with the BlackBox Recorder. If in doubt, reformat the drive and make a test recording of an hour or so to be sure. Then reformat the drive again before recording the performance. Drives are very cheap nowadays so we advise keeping a few spares around just in case.

Connecting a disk drive

Plug the disk drive into the USB2 socket on the back of the BlackBox unit and then power up the drive. The drive will be scanned, logged and ready to use in a matter of seconds. If it takes more than 20 seconds to log the drive or the BlackBox reports "WRONG DISK FORMAT", check that the disk is

formatted correctly. The BlackBox can be used to reformat the drive to FAT32 (see page 29)

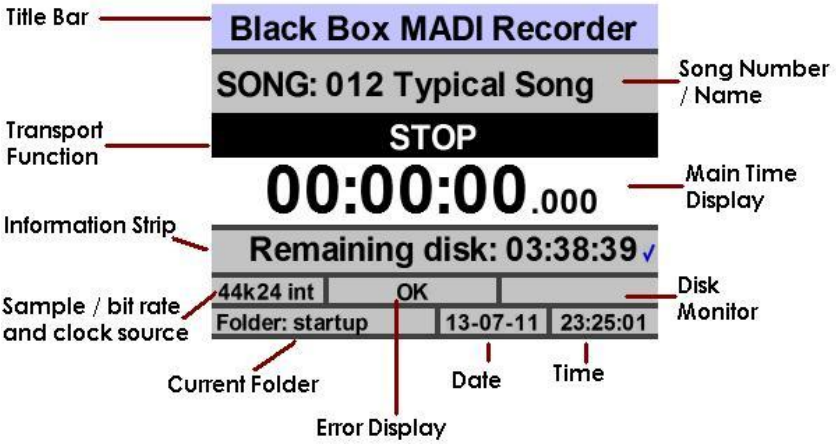
Power connection

The BlackBox Recorder is supplied with its own power supply which plugs into the dc inlet at the rear right of the unit (or left if you're looking at the rear as you read this). Although the unit can accept a suitable dc input between 7.5V and 16V it should always be used with the power supply provided.

Checking that everything works

Once you have powered the unit up, configured the input and output, connected and powered up the disk drive you should be ready to record. Press the record button and away you go!

The basic screen should look something like this when first powered up with a drive attached.



Normal operation

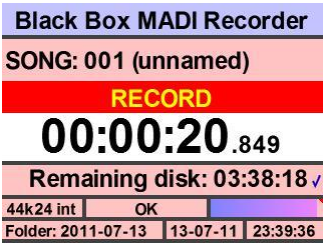
Whenever you power up the BBR it first checks the date against its internal real-time clock. If it's the first time the BBR has been powered up today, it will create a folder on the drive named \YYYY-MM-DD.bbr and make this the current folder where YYYY is the year, MM is the month and DD is the date. [The real-time clock will have been set up at the factory but you will need to adjust it to your local time – see page 27]. It does this so that all today's recordings will be kept together in one folder. If you happen to be recording a late concert which goes on past midnight, the BBR will not create a new folder until the next time it's powered up so all the song recorded during a typical concert will still be kept together.

The controls are all touch sensitive. Just place the flat part of your finger firmly on the panel over the control – the area your finger covers is more important than the pressure you apply.

Recording

On power up, the BBR is ready to record within seconds of logging the drive – just press the RECORD button, which will flash while the BBR prepares its files, and it will usually begin recording within a few seconds.

Once the unit is recording, the STOP button must be held down for a couple of seconds to end the recording. This is to prevent someone brushing against the controls and accidentally dropping out of record. The STOP button flashes until the BBR has finished closing the files properly.



However, if you want to mark the end of one Song and the start of another you can just press the RECORD button again.

You can also set MARKS within a Song by pressing the MARK button which will enable you to create loops easily for Virtual Sound Checking.

At the end of a recording the BBR will have to do some housekeeping such as writing file headers to the disk to keep it in prime condition. The DISK LED and STOP button will flash until the BBR has finished writing to the disk. Please wait until it has finished before starting the next operation. **It's particularly important that the files have been closed before you unplug the USB disk drive.**

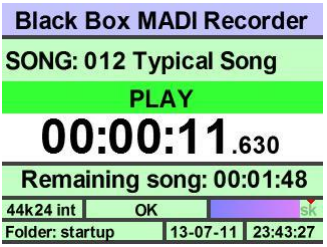
However, there are a few things that might need your attention. The BBR normally remembers its settings in Flash RAM internally so you should only have to set these things up once.

- You might want to record at a different sample rate or bit depth to that which the BBR is currently set at (page 24)
- The unit may be set up to only record certain tracks and you may want to record on more (or less) tracks (page 21)
- You may want to timestamp the recording against timecode (page 24) or to set up the unit to use an external audio clock (page 23)

All these items can be controlled from the menu which is described later in this manual.

Playback

Normally, the last recording made will be immediately available for playback. Just press the PLAY button and it will flash while it loads the files into its memory buffers before entering play.



However the BBR may be set to "PLAYBACK LOCKOUT" indicated by the LED in the Metering area of the front panel in which case the play button will have no effect. "PLAYBACK LOCKOUT" is a safety feature that prevents the engineer from accidentally starting to playback recorded material during the middle of the concert! This can cause severe embarrassment and could be a career limiting move for the sound engineer.

If the BBR is set to “PLAYBACK LOCKOUT” and you want to disable it temporarily to perform a Virtual Sound Check, press the MENU button to enter the MENU and PLAYBACK LOCKOUT is the first item on the list. Press MENU again and it will remove the tick (✓) mark against PLAYBACK LOCKOUT. Press BACK to exit the MENU and you can now use Playback normally. PLAYBACK LOCKOUT can be set to manual in the SETUP menu

Fast Wind

FAST FORWARD and REWIND functions within a SONG are achieved by holding the STOP button down whilst moving the data wheel.

Next / Previous Song

When the BBR is in STOP, the MARK and LOOP buttons will move you to the previous and next song respectively in the current folder.

Selecting Songs

To select other songs for playback you will need to press the MENU button. Move the data wheel until **Song Select** is highlighted; press MENU again; move the data wheel to select the song you want to playback; press MENU to confirm. You can also navigate to different folders on the disk using this feature.

Recent Songs

As Songs are played, they will automatically be placed into the **Recent Songs** list which is located in the **Song Select** menu. This allows you to quickly access the Songs that you regularly play for sound checks, etc. The Recent Songs list is stored on the disk itself so the list will change if you use a different disk.

File Names

By default, the BBR will name the audio files it creates as follows:

nnn-tt.WAV

Where ***nnn*** is the song number (between 001 and 999) and ***tt*** is the track number (between 01 and 64).

The track number is not shown on the main BBR user interface screen. However, the track number is determines which file appears on which output and is therefore vital for replaying songs and post production.

Renaming Songs

If you plug a keyboard into the BBR you can rename Songs to help find them later on the BBR or in post production on a Digital Audio Workstation (DAW). The keyboard connector on the BBR is a PS2 style Mini DIN connector. This was chosen specifically to avoid getting it mixed up with the USB connection for the Disk Drive. Most PC shops sell them very cheaply.

To rename a song: use “Ctrl-S” and then type in the name that you want. The BBR will accept capital and lower case letters, spaces and all normal characters that computers will accept in file names except the dash “-“ (any illegal characters will be replaced with an underscore “_”). You can navigate backwards and forwards using the left and right arrow keys and the delete and backspace keys operate as you would expect. Finish by pressing “Enter” on the keyboard. (Escape will cancel any changes). The resulting tracks will be called

nnn-tt.*Song Name*.WAV

where “***Song Name***” is the new name that you typed. This will rename all the tracks [01 - 64] of this song in this folder with this new Song Name. [Note: It is important for the BlackBox to keep the *nnn-tt* prefix so that it knows which audio files belong together as a Song and which track is to be played out of which output. It also helps some DAWs to place the tracks in their playlist in the correct order / position for playback.] So for example, if the current song is 001(unnamed) and you decide to name it “Herringbone”, you will end up with the following files on your disk

001-01.Herringbone.WAV
001-02.Herringbone.WAV
001-03.Herringbone.WAV
...
001-64.Herringbone.WAV

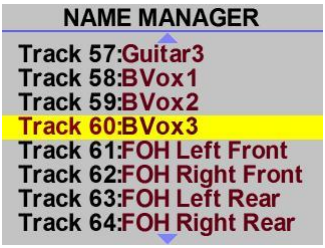
Renaming tracks

To rename a track: use "Ctrl+*<digit><digit>*T" on the keyboard (where *<digit><digit>* is a number between 01 and 64 to select which track you want to name) then type in the name that you want. The BBR will accept the same characters as for Song Names, above. Finish renaming the track by pressing "Enter" on the keyboard (or arrow up/down if you want to immediately name another track). The resulting tracks will be called

nnn-tt.Song Name-Track Name.WAV

where "*Track Name*" is the new name that you just typed. If you use the arrow down the BBR will automatically move on to the next track so that you can rename it too.

You may want to name all the tracks similarly for every Song that you're going to record. At most concerts, if the kick drum is plugged into channel 2 then it will remain that way for the whole evening if not the whole tour. To facilitate this, both the Track Arm MENU and the Name Manager MENU allow you to load the track names from an existing Song and then use them as a template. Select the Song which has appropriately named track as if for Playback (see above).



Enter the Track Arm MENU. Select "Load from Current Song". All Songs that you record subsequently will inherit the Track names. The track names will be stored in the Flash memory so you should be able to use them time after time. If you select "Update tracks on song edit", the BBR will update the track names of any Song that you rename allowing you to retrospectively name tracks.

So for example, assuming that channel 1 on the console is a bass guitar and channel 2 is a kick drum, you would use "Ctrl-01T" and then type "Bass" before pressing "Down Arrow" and then "Kick", etc. and you would end up with files named:

001-01.Herringbone-Bass.WAV
001-02.Herringbone-Kick.WAV
001-03.Herringbone-Snare.WAV
...
001-64.Herringbone-Daphne Nose Flute mic.WAV

The next Song might contain files named as follows:

002-01.Haddock Marsala-Bass.WAV
002-02.Haddock Marsala-Kick.WAV
002-03.Haddock Marsala-Snare.WAV
...
002-64.Haddock Marsala-Daphne Nose Flute mic.WAV

But it would name all the other tracks automatically.

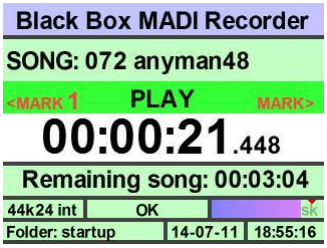
It is completely optional whether you rename Songs or Tracks. The BBR does not require you to do it; it merely helps in post production when they receive a disk with hundreds of WAV files in each folder. The basic naming scheme and time stamping will keep the files well organised anyway.

Virtual Sound Checking

If you are using the BlackBox Recorder for Virtual Sound Checking you may need the ability to Loop around certain sections of the audio, such as a chorus. This is where the MARK and LOOP buttons are primarily used.

MARK and LOOP operations

Pressing the MARK button during either during the Recording or during Playback will place Markers in the Song File itself. Multiple Markers can be set within a Song. The Markers are indicated on the Transport Function Bar



Having set some Markers, the LOOP button will create a playback Loop and continually playback the MARKED section of the Song.

If the LOOP button is pressed between Markers, the BlackBox will continue in Playback until it reaches the next Marker, Loop back to the previous Marker and then recommence playback.

There will be a short break in Playback while the BlackBox loops back to the earlier Marker (i.e. it does not create a continuous loop).

If, however, there are no later Markers pressing the LOOP button will create a Loop between the last Marker and the current playback position.

LOOP mode will remain active until you press LOOP again. You are able to STOP and restart PLAY whilst remaining in LOOP mode.

In STOP, holding down MARK and using the data wheel will jump to the next and subsequent Markers within the Song so that you can start Playback from a specific Marker.

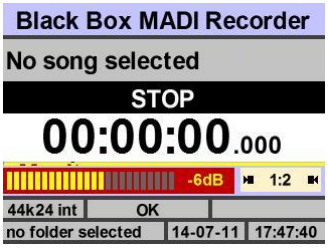
In PLAYBACK, holding down the MARK button while using the data wheel enables the deletion of Markers that are no longer required in the current Song. Clockwise movement will delete one, or more, later Markers; Anticlockwise will delete one, or more, earlier markers.

The Markers are stored in the audio files in what's known as a Cue Chunk which many (but not all) DAWs can read. So they may also be used to indicate a place in the recording to the post production team.

Monitoring

It is possible to monitor individual tracks or pairs of tracks on the BBR via the Pre-Fade Listen bus that is routed to the headphone output.

The data wheel will alter the volume of the headphone output (when not in the MENU). The volume is displayed on the colour display while you adjust it.



If you press the BACK button whilst not in the MENU you will alter the function of the data wheel between headphone volume control and PFL channel select.. In the latter mode, using the wheel will cycle through all of the channels: "1-2"; "3-4", etc. up to "63-64". The Red background on the information strip shows whether you're set to adjust the PFL channel or headphone volume.

The headphone output is routed through an automatic gain control so that quiet signals can be as easily heard during the concert as louder ones. This does not affect the recording at all. The amount of automatic gain in the headphone signal chain is adjustable in the Setup Menu (up to 40dB of gain) and the current gain added is indicated by yellow dots on the gain display.

Summary of Combined Controls in MAIN Screen

Transport Mode	Press/***Hold***	**Wheel**	**Function**
Any	-	< or >	Headphone volume / PFL channel
Any	*BACK*	< or >	Swap wheel function between headphone volume and PFL channel
In STOP	***STOP***	< or >	Fast rewind or Fast forward wind
In STOP	***MARK***	< or >	Select MARKER for PLAY position
In STOP	MARK	-	Select Previous Song
IN STOP	LOOP	-	Select Next Song
In PLAY	***MARK***	<	DELETE previous MARKER(s)
In PLAY	***MARK***	>	DELETE subsequent MARKER(s)
In PLAY	LOOP	-	Enter LOOP mode at next MARKER or immediately if no subsequent MARKERS
In PLAY/RECORD	MARK	-	Set a MARKER at current time
In RECORD	RECORD	-	Mark the start of a new SONG

Using the Menu

The following section discusses the menu in more detail. Throughout the menu operations the MENU button moves forward through the structure and also acts as a CONFIRM button; the BACK button moves backwards through the menu structure and can act as an ESCAPE button. The data wheel acts as a selector and data entry wheel whilst in the menu structure. The MARK and LOOP buttons also replicate the wheel to advance down or retreat up the menus, selecting the next or previous menu item.

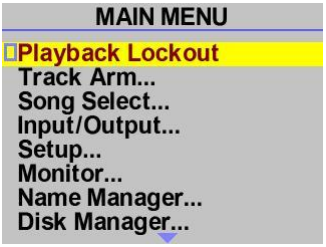
Once you have adjusted and confirmed the setting or parameter that you want to change, use the BACK button to exit the menu and get back to the normal main screen display. On the whole it's pretty obvious so try it.

Menu Structure and operation

To enter the menu, press the MENU button in the Control section of the front panel.

Setting up adjustable parameters

This list may not be exhaustive as JoeCo is constantly improving its products and may have added features to the software since this document was authored. However, this will give you a good idea of the basics and you can always get the most up to date information from the website.



The currently selected Menu item is highlighted in Yellow.

When a Menu item to be adjusted is selected, the display changes to yellow text on a red background. You can then use the control wheel to change the setting before confirming with the MENU button or rejecting your changes with the BACK button. Some real time functions cannot be rejected with the BACK button.

Unavailable items are "greyed out" in light red text.

Playback Lockout

Playback Lockout has two settings, on & off, indicated by a tick (✓) beside the option in the MENU and the LED in the Meter area. In the setup menu you can decide to control Playback Lockout manually or set it to be asserted automatically whenever you enter record as a safety measure.

Track Arm...

Arm All: Arms (enables recording on) all tracks.
Disarm All: Disarms (disables recording on) all tracks.

Arm ticked: Arms the tracks (listed below) that have a tick "✓" (sometimes called a "check mark") beside them.
1...64: the tracks which can be ticked or unticked using the MENU button and then Armed using the **Arm Ticked** menu item above. Track names (if used) are displayed here also. (See **Renaming Tracks** on page 17)
Clear all track names: this clears all the displayed track names – subsequent recordings will not use track names (unless you rename them)
Load from current song: this loads the track names from the current song into the track display. Subsequent recordings will use these track names.
Update track on song edit: when ticked the track names will be appended to any song when you edit its name.

Song Select...

This loads the Song Select Menu allowing you to select Songs for playback. The options are:

Recent Songs...

Provides a list of the most recently played Songs – useful if you're on tour and want to use the same songs in each venue for sound checking

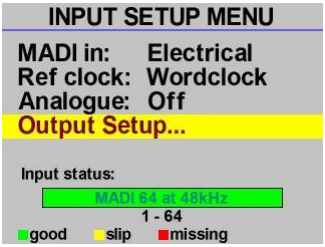
Select Song Folder...

Allows you to navigate to a particular folder. This automatically loads...

Select Song...

Allows you to choose a Song from within the selected Folder.

Input/Output...



This menu item allows you to set up the audio input and output and determine how the BlackBox should clock to the incoming data stream. **MADI In:** is selectable between Electrical (Coax BNC) and Optical (SC connectors). The **Reference Clock:** (see below) will normally either be provided via a wordclock BNC signal or you may need to extract

the clock from the incoming MADI data stream. Once these two items are correctly selected, the **input status bar** displays whether there are errors or clock slippage. The input status display is also echoed at the top of the main screen if an error or any digital slippage occurs. Any clock errors are noted in the error display area of the main screen. The Clock Error Display can be cleared using the STOP button. The information area of the main screen will indicate when the Reference clock is missing or when a digital signal slip occurs.

Analogue: Normally set to "Off" can either insert or replace any 8 of the digital channels in the MADI data stream. This will normally only be used if you are using a console with Legacy (56 channel) MADI and want to use separate mic pre-amps to capture the audience or ambience of the venue without taking it through the console

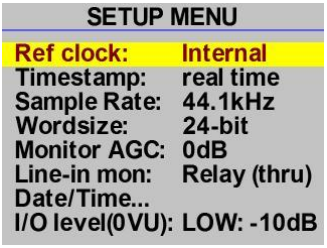
Output Setup... allows you to control whether the **output format** is Legacy (56 channel) or full MADI-X (64 channel). You can also set up the **wordclock** BNC connector to output wordclock rather than be an input. It is also possible to have a separate **reference clock** for the output MADI stream and this too is set here.

Setup...

This section contains the most frequently adjusted parameters.

Reference Clock

This very important item determines where the digital sample clock is derived from. The options include extracting the clock from the **MADI** input stream; using the external **word clock** BNC connector; less often, the **S/PDIF** external clock from the RCA (Phono) socket on the rear panel, or on rare occasions, clocking the whole system from the **internal** reference oscillator.



It is very important that you understand why digital clocking is important, if you don't know already, especially if the concert is being filmed or videoed at the same time. Please spend some time talking to people further down the post production process to find out what they would like or recommend, or consult our FAQs on the JoeCo website.

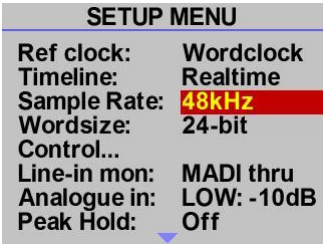
Timeline

Broadcast WAV files include a timecode stamp which marks the time of the first sample of the file and helps re-sync the files in the post production process. This can be derived from a source of Linear Timecode (**LTC**) or MIDI timecode (**MTC**) or from the **realtime** clock built into the BBR.

The BBR can only read timecode (i.e. act as a timecode Slave) it cannot generate timecode (i.e. act as a timecode Master). The BlackBox does not chase timecode or lock to it; it stamps the first sample in each file with the timecode and extrapolates from there.

Sample rates

Selectable between **44.1kHz**, **48kHz**, **88.2kHz** and **96kHz**. At the double sample rate speeds, the track count is divided by two turning the MADI recorder into a 32 track machine



Wordsize:

24bit or **16bit**. Choose 24bit unless you're really short on disk space.

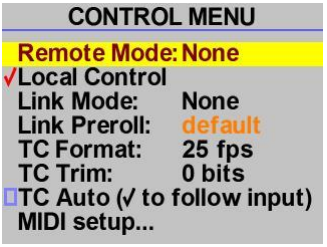
Control...

The BlackBox Recorder can accept commands from an external control device such as a console or hardware controller.

Remote Mode:

The BBR can respond to open loop MIDI Machine Control (**MIDI MMC**) protocol commands for transport controls and track arming/disarming. Note though that the BBR has no MIDI return path (open loop) and so cannot acknowledge the receipt of a MIDI command or display the song time on the

controller. The BBR can also respond to **Sony 9-pin** Machine Control (also known as SONY PII) protocol commands for transport controls and track arming/disarming. The ring of the LTC/F.sw TRS jack socket can accept a momentary **footswitch** which will emulate pressing the record button (starting a new recording or marking a new song). If you need to use this facility with LTC timecode you'll need to make up a special cable but if you're just using a standard footswitch push the jack in half way.



Link Mode and Link Preroll

Used for linking multiple BlackBox Recorders together: see section later in this manual on page 32.

TC Format

Set the timecode frame rate. The BlackBox will then flash the time code display (bottom right of main screen) if the incoming time code is at a different rate to that which you have chosen.

TC Trim

This is a special feature that allows post production users to trim the timecode for more accurate time-stamping. It will not be of much use in a Live situation.

TC Auto

Set the internal timecode format to match the incoming timecode. This can cause problems later in post production if your source of timecode is intermittent and happens to start at the same time as a recording. Using this mode is deprecated

MIDI SETUP

Please see the separate document available in the log in area on the JoeCo website

Line-In Mon:

This adjusts how the unit monitors the Line-In signals on all channels. The options are: **E-E (via DSP)** where signals are routed all the way through the system, **MADI thru** where the input is echoed to the output at the source, and **Off** where the input audio is turned off (useful for playback applications).

i/o level (0VU):

Only relevant to Analogue i/o. The two settings are **LOW** and **PRO** as described earlier in this document (Page 9).

Peak hold

This determines how long a peak level will be displayed on the Meters. During the setup and sound checking it is probably worth setting it to "forever" so that you can easily tell if any of the mic amps are overloading and back them off accordingly. During the concert itself, you can set them back to whatever you find most helpful as it's probably too late to adjust the mic amps down at this stage. Digital distortion is not pleasant to listen to and will probably render your recording useless. You may not notice it live but you will hear it on the recording. Please leave yourself enough headroom when you're recording a concert. If you've set the level correctly, the red meters should flash infrequently if at all.

Playback Lockout

You can set playback lockout to be automatically asserted after you've made a recording or to be controlled manually. See Playback Lockout section on page 21

Rec stop hold:

Normal requires you to hold the stop button down for a second or so to end a recording; **Extend (10s)** requires you to hold the stop button down for 10 seconds to end a recording. Specifically added for the more paranoid users.

Display Song TC on Play

This setting changes the main on-screen time display. When ticked, the main display shows the incoming timecode or the timecode embedded in the playback file rather than the length of the recording or where the BBR is in the Playback of this file. It is most useful when working with Timecode

Adjusting the real-time clock

The real-time clock is used to create folders on the drive with a logical name so that you can find your recording again later. It's also used to timestamp your recordings when no other reference (such as Linear Time Code) is available, so it's a good idea to make sure that the clock is set correctly.

Select **Date/Time** from the **Setup** menu. Select which field you want to adjust. Press MENU to edit the field with the data wheel and then Menu again to confirm and the BBR moves onto the next field automatically. Press BACK when finished.

Reset

Resets the BlackBox back to its factory state – useful if you've forgotten what parameters you've changed.

Monitor...

Monitor AGC

This sets up the automatic gain control on the headphone monitor outputs, helping you to hear what's going onto disk in a noisy live environment.

Solo in: Affects whether the PFL bus for metering and headphones is working in mono (1 channel) or stereo (2 channels).

BACK: This affects how you use the PFL bus. There are two settings: in **toggles level/select** the operation of the data wheel can be toggled between selecting the PFL channel and the headphone volume by pressing the BACK button when on the main screen; in **Hold for channel select** you have to hold the BACK button down whilst using the data wheel to select different channels onto the PFL bus. The latter mode is mainly for legacy users of BlackBox Recorders.

Name Manage...

The Name Manager menu allows you to set up the optional naming conventions that you want to use. Naming songs and tracks is not mandatory but it can help a lot during the post production process. It is possible to name Songs and tracks using the menu buttons and data wheel but you'll find it much quicker using a standard 102 key PS2 keyboard. The "**^**" character in the following list indicates a keyboard "hotkey". Holding the Ctrl key on a keyboard whilst pressing the following letter will allow you to change that field. Most hotkeys can be used during a Recording

Next (^p): will **p**rename the next Song that you record

Reuse next songname will use the same song name for each subsequent recording

Folder (^f): Displays the current folder's name and allows you to rename it. Note though that the BlackBox will always record into a folder named with today's date so if you rename today's folder before you've finished recording all subsequent recordings will be made into a new folder.

Song (^s): This displays and allows you to name the current song.

Use track names on rec enables the template function so that each track name will be taken from the template.

Track 1...Track 64. These are the template names for each track

Clear track template. Removes all the template names

Copy trk names from song. This copies any track names in the current song into the template

Show song tracks on load. This will populate the list with the track names of the current song

^t also updates template. When ticked using ^t (name track) will update both the current song and the template

Disk Manage...

This allows you to set up certain parameters regarding how you use the disk. It also allows you to format a USB2 disk drive for use with the BlackBox Recorder and with any Mac or PC based workstation.

Maximum File Size:

Certain popular Digital Audio Workstations are a little fussy about playing back very long files. For this reason the BBR can automatically split very long recordings into files whose maximum length is 1GByte, 2GByte or 4GByte. Check with the post production facility that's most likely to be using the files that you record to check what their equipment is capable of accepting. If you don't know, the 2G file size is the best compromise.

Volume: / Disk Partitions:

Very large disks are sometimes "partitioned" into multiple drives. If you were to plug a partitioned drive into Windows, for example, it would look as though you had plugged in two or more drives at the same time and might appear within Windows Explorer as drive E:, drive F: and drive G:. This part of the BBR interface allows you to select which partition to use.

Format...:

This option allows you to format a USB2 drive ready for use with the BlackBox Recorder which will be compatible with any Mac or PC based Digital Audio Workstation. When you enter this part of the menu, you will first have to **Select** the partition that you want to format: The BBR defaults to partition "none" as a safety measure to prevent accidental formatting of a drive.

Having selected the partition the BBR displays the current status of that partition. You can then move onto Format Partition to actually format the drive. Again there are warning messages to try and prevent accidents.

The final option in the menu allow you to partition the drive into one or more usable partitions. This subject is covered in much greater detail in the FAQ section of the JoeCo website www.joeco.co.uk/main/faqs

Write Protect Disk:

This allows you to stop the BlackBox MADI Recorder writing any data to the disk at all. It will not prevent other computers overwriting the disk if you plug the drive into them. It is mainly used for Playback applications.

Software updates

It should be noted that JoeCo may release software upgrades from time to time, either to add features or to cure bugs that have been found in the software – though we have endeavoured to remove all that we've found.

Therefore, this document may be superseded in the future as other items are added to the menu structure. We will note any significant changes in the on-line version of the User Manual which will be found in the visitor area of JoeCo website. Go to www.joeco.co.uk and use Log In to register

The software version currently installed into the BBR is displayed on the LCD display during the boot procedure and can also be seen in the "About" Menu. (N.B. In the event of reporting any suspected problems you will need to give the whole system serial number and the entire 2nd line of the About Menu as this contains both software and hardware version information.)

To load a new software update into the BBR:

Note your current version and ideally ensure that you have a copy in case the update process fails for any reason. It is never a good idea to upload a new piece of software immediately before an important recording – please give yourself enough time to fully test that the software works to your satisfaction before you need to use it in anger.

Ensure that you have a stable source of power during the update process – we have endeavoured to make the update process safe if the power fails during an update, but there is always the possibility that something could go wrong, requiring a return to the factory for a chargeable repair.

Download the new update file from the End User area of JoeCo website directly into the root folder of a FAT32 USB2 hard drive or a FAT32 formatted memory stick (note memory sticks or Pen drives are often

formatted with FAT16 which will not work). The file must be called "update.bbr" or "update vxxxxxx.bbr" (where xxxxxx indicates the version number) and it must be placed in the Root folder of the disk. Note some web browsers append numbers after the file name if you download the same file more than once and these will not work until renamed as above.

In the Update menu, set the BBR to **Permit: Upgrade Only** and then plug the drive (or memory stick) into the USB2 socket.

The BBR will notice the presence of the "update.bbr" file when it logs the drive and ask you whether you want to upload it. Select "Yes" by pressing the MENU button or "No" by pressing the BACK button.

Having uploaded the new file the BBR will automatically reboot into the new software version. Connect your main disk drive and you're ready to use the new software.

The BBR should then be set back to **Permit: No updates** in the update menu after you've loaded the new software to avoid checking for updates on future boot ups.

The other setting in the update menu allows you reload an old version of the software just in case you need to downgrade back to a previous version whose features you're already familiar with.

Manage Updates:

This option should only be used if absolutely necessary – it can result in a chargeable return to factory if things go wrong.

Update files are loaded alongside the factory installed software and you will notice that the BBR takes almost twice as long to boot up once you have loaded an update file. Some applications require a very fast boot time and "Manage updates:" allows the user to permanently overwrite the factory installed software with an installed update file once they are happy with it.

However, IF THE POWER FAILS OR ANOTHER ERROR OCCURS WHILE THE UPDATE IS OVERWRITING THE MAIN OPERATING SYSTEM THE BLACKBOX

WILL HAVE TO BE RETURNED TO THE FACTORY AT YOUR EXPENSE FOR REPAIR.

Licence...

This allows you to licence certain chargeable options more details of which are available on the JoeCo website. You will need to advise JoeCo of the **machine key** along with your payment details before JoeCo can enable any optional software. You will then receive a non-transferable enabling code for your BlackBox and can be entered into the unit using the **Enter key:** feature

Linking multiple BlackBox Recorders together

It is possible to link multiple BlackBox MADI Recorders together to make recordings with more than 64 channels or to make redundant copies by duplicating the signal path completely. Each BlackBox Recorder will still require its own USB2 disk drive as only 64 channels of data will be recorded to each drive. This will also provide benefits in post production as many popular DAWs will only play back a limited number of tracks from each external drive.

As stated earlier in this manual, ensuring that the units are synchronised with both the clocking and starting sample of each recording being locked together is vital for being able to replay the material later in a DAW environment. However, in a BBR64MADI system it is vital that the MADI data is properly recovered from the MADI data stream. You will therefore want to use either Wordclock or MADI as your reference clock.

The BBR will then use the S/PDIF link (labelled "**Ext Clk**" on the RCA sockets on the rear panel) to pass control data and timecode information between the master unit and the slave(s). The Master unit embeds this control data and timecode into the sub-code of the SPDIF data stream. In this mode the digital audio clock signal between units is ignored. The Slave units can either be daisy chained together from the Master unit or preferably be fed their clocking and control signals from a distribution amplifier. You will need short RCA (phono) jumper cables to connect each subsequent unit.

Using an AES/EBU Distribution Amplifier

Master **Ext Clk Out**	feeds	Distribution Amplifier input
Distribution Amplifier	feeds	**Ext Clk In** on **all** slave units

Daisy Chaining Units

Master **Ext Clk Out**	feeds	Slave1 **Ext Clk In**
Slave1 **Ext Clk Out**	feeds	Slave2 **Ext Clk In**
Slave2 **Ext Clk Out**	feeds	Slave3 **Ext Clk In**
Slave3 **Ext Clk Out**	not used.	

In the SETUP;CONTROL menu, select **Link Mode**. Select **Master** for the recorder you want to act as the master controller (which will always record channels 1-64). The Slave units should be set to **Slave**. When linking machines, you can easily exceed the two digit track numbering scheme so the BBR64MADI and BBRDANTE systems automatically adopt a three digit track number scheme when switched into master / slave mode. The starting track number for each slave unit can be set in the Setup; Control menu.

The slave units automatically take their transport control signals from the link connection and will lock out the transport controls on all but the master unit. Slave units also dim their screen displays to make it obvious that they are being controlled remotely.

(The link signal between Master and Slave units is proprietary and does not conform to the SPDIF protocol)

You then operate the Transport Controls of all the linked BBRs from the Master unit. Please note though that the headphone monitoring for each unit will still appear only on the unit that is recording those signals, so you will have to either use multiple headphones or swap them from one unit to the next if you need to monitor the higher numbered channels on the Slave systems.

Master/Slave Recording

Any slave units will go into record as soon as their respective disk is ready, so they may not start together and their time displays may not appear to be perfectly in sync. However, all the files recorded will have an accurate time-stamp and so will be in sync when imported into a DAW.

Master/Slave Playback

In order to playback synchronously, each machine must have its **pre roll** time set to ensure that the disk files can all be ready in time. The default time will normally be ok but this can be adjusted in the Control section of the Menu (see page 25). The tracks from each unit may not necessarily start simultaneously but they will be in sync when their audio starts. If the pre roll time is too short you will see a message on one or more of the machines saying **PRE ROLL MISSED.**

If you are using the BBR for Virtual Sound Checking you will want to set Playback Lockout on the Slave units to Manual.

Safe'n'Sound Record Recovery

The BlackBox Recorder software includes **Safe'n'Sound Record Recovery**. This software feature endeavours to protect your recording against every eventuality such that even if the drive is unplugged, or the power is removed from the drive or the BlackBox during a recording, Safe'n'Sound will try and recover the files as soon as the drive is plugged back into a BlackBox Recorder.

Whenever a disk drive is plugged into the BlackBox Recorder, the disk's filing structure is checked and if any audio files are found to not have been closed properly, Safe'n'Sound repairs them automatically, leaving all the files accessible by normal workstations.

Whilst Safe'n'Sound cannot protect against a physical hard drive failure (which are very rare nowadays), it helps protect against human error or power failure.

As a background task the BlackBox Recorder also scans the disk to calculate the remaining disk space and to find where the first free space is located on the disk. When it has found this information and correctly updated the drive it places a tick (check mark) beside the remaining disk time.

Using a PS2 keyboard

The BlackBox Recorder can accept a standard 102 key PS2 style keyboard. Currently most mini keyboards are not supported especially those that require some set up drivers to be installed on the PC. The most consistently reliable keyboards we have found are the Microsoft 500 style PS2 keyboards which can be obtained in most countries for around US$10 (£6). Some USB keyboards will work with USB to PS2 converters but not all.

In the following document the ^ character is used to indicate holding the Ctrl key down whilst pressing the key i.e. ^s = Ctrl-s

Direct edit from keyboard (various keys combined with ctrl key)

When not editing we implement various control keys to enter text edit directly (without using menus).

^S	edit current song name
^nnT	edit track name for track “nn”
^P	prename the next song before recording it
^F	rename current folder

Keyboard controls during text edit

^C	Cut
^A	select all
^V	paste
L / R arrow ←/ →	move cursor left or right along line of text
Up / down arrow ↑ / ↓	in single line edits where there is a natural prev /next no (e.g. track, ixml note), accept current edit and move to prev / next
Return / Enter↵	complete and accept edit
Esc	abandon edit, no change to text
NB. the return / Enter↵ key is the character key not the keypad enter; the ←→↑↓cursor arrow keys are the dedicated cursor keys, not the keypad keys	

Keyboard transport controls

These are the numeric keypad keys (not the character keys)

Enter	PLAY
Del/.	STOP
Ins/0	STOP AND RETURN TO ZERO
*	RECORD
+	MOVE TO NEXT CUE POINT
-	MOVE TO PREVIOUS CUE POINT

Keyboard navigation

These are the cursor keys (not keypad)

Right arrow → or Enter↵	Same effect as pressing MENU
Left arrow ← or Esc	Same effect as pressing BACK
If menu is open but no field selected	
Down arrow	move to next item in list (like clockwise wheel turn)
Up arrow	move to previous item in list (like anticlockwise wheel turn)
If menu is open and field is selected	
Down arrow	increment option (like clockwise wheel turn)
Up arrow	decrement option (like anticlockwise wheel turn)

Troubleshooting

We are confident that the BlackBox Recorder will give you long and reliable performance but in case you have difficulties, here are a few things to try before you call your dealer or distributor.

Problem	**Things to try**
No lights on BBR unit	• Check that the power supply is getting mains power and that the correct power supply is plugged correctly into the BBR • If you have access to a volt meter, check that the power supply is producing at least 9V.

Problem	Things to try
No display on LCD screen	• Check power supply as above • Reboot (turn power off, wait 10 seconds and turn power back on again)
BBR not responding to controls	• Check if disk activity light is operating continuously for more than a few seconds. This may indicate a disk problem. Try power cycling BBR and Disk drive. Check disk for errors as soon as possible on a PC or Mac
BBR boots ok but does not log / find disk	• Check that the USB connector is plugged in correctly to both the BBR and the disk drive • Check disk drive power supply as above. • Try a different USB2 lead • Try powering up the BBR without a drive attached and then plugging the drive in afterwards • Check that the disk drive is formatted with a FAT32 filing system and the BBR is not displaying WRONG DISK FORMAT
BBR will not enter RECORD	• Is the disk full? Check the time remaining display
BBR will not enter PLAY	• Check if the BBR is set to PLAYBACK LOCKOUT? • Do you have a song selected? • Maybe there is nothing recorded as yet on this disk or no recordings in the current folder?
BBR sounds ok but no movement on meters	• Check that channels are record enabled. • Check that levels from console are reasonably high (> -40bDu)
Some channels not audible	• Check the cables feeding audio into the BBR • Are some channels not record enabled?
Sound through BBR distorted	• Try different cables • Try clocking from a different source
BBR sounds ok during record but is distorted in playback	• Try another recording from a previous concert and see if this is also distorted
Cannot locate previous night's recording	• Are you using a different disk drive from last night? • Are you looking in the right folder? • Can you check the drive in a normal laptop to locate the previous night's folder?
Power removed before BBR has finished writing to disk	• It is often possible to recover files even when the BBR has been powered down whilst still writing to its disk. (See Disk Recovery page 34)

If the above list does not solve the problem you are having, please contact your dealer in the first instance and then your local distributor to help you resolve the issues.

Summary Of Alert Messages

"Hold STOP button to stop"	displayed when STOP is pressed
"PLAYBACK LOCKED OUT"	can be displayed if PLAY is pressed and PLAYBACK LOCKOUT is on
"CONNECT VALID DISK"	displayed if PLAY or RECORD is pressed but disk is not connected
"DISK BUSY"	displayed if PLAY or RECORD is pressed but disk is busy (reserved, e.g. for song selection)
"DISK TOO SLOW"	displayed if requests to the DISK have not been serviced in time.
"NEW SONG"	displayed if the user presses RECORD during record to start a new song
"NO SONG SELECTED"	displayed if someone presses PLAY but no song is selected
"SELECT VALID DISK"	displayed if PLAY or RECORD is pressed but the disk is not valid
"DISK FULL"	displayed if PLAY or RECORD is pressed but the disk is full
"CHECK/SELECT DISK"	displayed if PLAY or RECORD is pressed but the disk returns an error
"GENERAL ERROR"	displayed if there is an internal error, e.g. out of memory
"BAD SONG FILE"	displayed if PLAY or RECORD is pressed on a corrupted song file
"CAN'T FIND SONG"	displayed if PLAY or RECORD is pressed when the selected song is not available
"CAN'T FIND FOLDER"	displayed if PLAY or RECORD is pressed when the selected folder is not available
"LOOP TOO SHORT"	displayed if LOOP is pressed and the loop length is too short
"CHECK MASTER SIGNAL"	displayed if Slave is not receiving clock and control from Master

"REMOTE CONTROLLED"	displayed when in remote control or slave mode, and a disabled operation is attempted
"PLAY OUT OF RANGE"	when in remote control or slave mode, PLAYBACK is attempted outside the time-code limits of the selected Song
“DIGITAL INPUT MISSING”	A source of digital audio is not correctly plugged in or has vanished
“DIGITAL SLIP”	A source of Digital audio is not properly synchronised with the BlackBox and is slipping with respect to the chosen clock source
“REF CLOCK MISSING”	The external reference clock is not providing a valid clock signal
“PRE ROLL MISSED”	The Pre Roll setting in Setup; Control is too short.

JoeCo Conditions of Use

IMPORTANT: BY USING THIS PRODUCT YOU ACKNOWLEDGE THAT YOU HAVE READ, UNDERSTOOD AND AGREE TO BE BOUND BY THESE CONDITIONS OF USE AND THE TERMS OF THE JOECO SOFTWARE LICENCE AGREEMENT. JOECO'S SOFTWARE LICENCE AGREEMENT IS SET OUT IN THE USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT WWW.JOECO.CO.UK

PLEASE READ THESE CONDITIONS OF USE (THE "CONDITIONS") CAREFULLY BEFORE USING YOUR JOECO PRODUCT. BY USING YOUR JOECO PRODUCT YOU ARE AGREEING TO BE BOUND BY THESE CONDITIONS. IF YOU DO NOT AGREE WITH THESE CONDITIONS, DO NOT USE THIS PRODUCT.

IF YOU DO NOT AGREE WITH THESE CONDITIONS, YOU MAY RETURN THIS PRODUCT WITHIN SEVEN DAYS OF THE DATE YOU RECEIVED IT TO THE AUTHORISED DISTRIBUTOR OR RESELLER WHERE YOU PURCHASED IT FOR A REFUND, SUBJECT TO JOECO'S PRODUCT RETURNS POLICY. JOECO'S PRODUCT RETURNS POLICY IS SET OUT IN THE PRODUCT USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT www.joeco.co.uk

Definitions

JoeCo: JoeCo Limited

Product: any product designed, manufactured, distributed or resold by JoeCo including the BlackBox Recorder (which may be abbreviated to "BBR"). The term "product" includes both the hardware and its associated software, as defined below.

Legitimate User: a legitimate user (hereinafter referred to as a "User") is a person, or corporate entity or employee of a corporate entity who is:

- the owner of a Product (following its original purchase from JoeCo, or an authorised JoeCo distributor or reseller, or its subsequent purchase from a legitimate owner) and has accepted the terms of this agreement
- using a Product on loan from its owner, where the owner has given their express permission and ensured that the user does so only on condition that they first accept the terms of this agreement
- using a Product under a rental agreement with its owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement
- using a Product under a temporary evaluation arrangement with its owner (which may be JoeCo or one of its authorised distributors or resellers), for a period determined by the owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement

Hardware: the tangible elements of the Product

Software: the operating software of the Product (whether in read only memory, on any other media or in any other form) supplied by JoeCo whether installed at the factory or subsequently upgraded by yourself, an authorised JoeCo distributor or reseller, or any other individual or organisation. It includes remote control software, documentation, data and any other software, including software updates, supplied by JoeCo.

1. Risk and Limitations of Product Use

You, the User, expressly acknowledge and agree that:

- To the maximum extent permitted by applicable law, use of the JoeCo Software is at your sole risk and that the entire risk as to satisfactory quality, performance and accuracy is with you.
- You have evaluated the Product and accepted the suitability for your application.
- JoeCo Products are not designed, intended or suitable for use in any life-critical applications or situations or environments where the failure or time delays of, or errors or inaccuracies in, the content, data or information provided by the JoeCo Product could lead to death, personal injury, or severe physical or environmental damage. Any such use is entirely at the risk of the User and JoeCo and its authorised distributors and resellers have no responsibility or liability whatsoever for any claim arising from such use.
- JoeCo recorder Products are designed to enable you to record and reproduce material to which you own the copyright, or material which the copyright owner has granted you permission to record and/or reproduce.
- It is illegal to record, reproduce, distribute, sell, hire, lend, perform or broadcast all or part of a work (written or musical composition, broadcast, performance or similar) whose copyright is held by a third party without permission of that third party.
- JoeCo Products must not be used for purposes that could infringe a copyright held by a third party or could, in any other way, be illegal. Any such use is entirely at the risk of the User and JoeCo and its authorised distributors and resellers have no responsibility or liability whatsoever for any claim arising from such use.

2. Limitations of Liability

Except for JoeCo's limited Hardware Warranty (see Warranty Information in the relevant JoeCo User Manual or via the JoeCo website at www.joeco.co.uk), to the maximum extent permitted by applicable law, JoeCo hereby disclaims all warranties and conditions with respect to the Product and any services performed by use of the Product, either express, implied or statutory, including, but not limited to, the implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.

No oral or written information or advice given by JoeCo or by an authorised JoeCo distributor, reseller or representative shall create a warranty of any kind.

In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the User, purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

Software Licence Agreement

JOECO LIMITED

SOFTWARE LICENCE AGREEMENT

USER LICENCE

IMPORTANT: BY USING THIS PRODUCT YOU ACKNOWLEDGE THAT YOU HAVE READ, UNDERSTOOD AND AGREE TO BE BOUND BY THE TERMS OF THIS SOFTWARE LICENCE AGREEMENT AND THE JOECO CONDITIONS OF USE. JOECO'S CONDITIONS OF USE ARE SET OUT IN THE USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT WWW.JOECO.CO.UK

PLEASE READ THIS SOFTWARE LICENCE AGREEMENT (THE "LICENCE") CAREFULLY BEFORE USING YOUR JOECO PRODUCT OR DOWNLOADING ANY SOFTWARE UPDATES. BY USING YOUR JOECO PRODUCT OR DOWNLOADING ANY SOFTWARE UPDATES, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENCE. IF YOU DO NOT AGREE WITH THE TERMS OF THIS LICENCE, DO NOT USE THIS PRODUCT OR DOWNLOAD OR INSTALL ANY SOFTWARE UPDATES.

IF YOU DO NOT AGREE WITH THE TERMS OF THE LICENCE, YOU MAY RETURN THIS PRODUCT WITHIN SEVEN DAYS OF THE DATE YOU RECEIVED IT TO THE AUTHORISED DISTRIBUTOR OR RESELLER WHERE YOU PURCHASED IT FOR A REFUND, SUBJECT TO JOECO'S PRODUCT RETURNS POLICY. JOECO'S PRODUCT RETURNS POLICY IS SET OUT IN THE PRODUCT USER MANUAL AND MAY ALSO BE FOUND ON THE JOECO WEBSITE AT www.joeco.co.uk

IN ADDITION, BY DOWNLOADING, COPYING, INSTALLING OR OTHERWISE USING SOFTWARE UPDATES FROM JOECO YOU AGREE TO BE BOUND BY ANY ADDITIONAL LICENCE TERMS THAT ACCOMPANY ANY SUCH UPDATES. IF YOU DO NOT AGREE TO THE ADDITIONAL LICENCE TERMS THAT ACCOMPANY SUCH UPDATES, YOU MAY NOT DOWNLOAD, COPY, INSTALL OR OTHERWISE USE SUCH UPDATES.

Definitions Used In This Agreement

JoeCo: JoeCo Limited

Product: Any product designed, manufactured, distributed or resold by JoeCo including the BlackBox Recorder (which may be abbreviated to "BBR"). The term "product" includes both the hardware and its associated software, as defined below.

Legitimate User: A legitimate user (hereinafter referred to as a "User") is a person, or corporate entity or employee of a corporate entity who is:

- the owner of a Product (following its original purchase from JoeCo, or an authorised JoeCo distributor or reseller, or its subsequent purchase from a legitimate owner) and has accepted the terms of this agreement
- using a Product on loan from its owner, where the owner has given their express permission and ensured that the user does so only on condition that they first accept the terms of this agreement
- using a Product under a rental agreement with its owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement
- using a Product under a temporary evaluation arrangement with its owner (which may be JoeCo or one of its authorised distributors or resellers), for a period determined by the owner, where the owner has ensured that the user does so only on condition that they first accept the terms of this agreement

Hardware: The tangible elements of the Product

Software: The operating software of the Product (whether in read only memory, on any other media or in any other form) supplied by JoeCo whether installed at the factory or subsequently upgraded by yourself, an authorised JoeCo distributor or reseller, or any other individual or organisation. It includes remote control software, documentation, data and any other software, including software updates, supplied by JoeCo.

1. General

You agree that:

- The Software is licensed, not sold, to you by JoeCo for use only under the terms of this Licence on the associated Product
- All ownership rights to the Software belong to JoeCo and/or to JoeCo's co-developers or suppliers
- You will not copy (except as expressly authorised by this Licence or separately in writing by JoeCo) or attempt to decompile, reverse engineer, disassemble, derive the source code, modify or create derived works of any aspects of the Software or hardware provided by JoeCo. You accept that any attempt to do so would be a violation of the rights of JoeCo, its co-developers and suppliers and constitute a breach of this agreement.
- JoeCo, its co-developers and suppliers reserve all their rights not expressly granted to you.
- You will use the Software in compliance with all applicable laws, including local laws of the country or region in which you live and/or use the Software and/or download updates to the Software

Parts of the Software and Product hardware are protected by international patents either granted or pending and other intellectual property rights.

No licence is granted by this document for use beyond the licensed use of the Software. Violation is subject to damages under applicable laws.

2. User Licence

You, the User, are entitled to use all parts of the Software for the duration of the life of the Product.
If the Product is sold on to a third party a new user is entitled to the same use, that is to use all parts of the Software for the duration of the life of the Product, provided that they agree to all the terms of this Licence.

3. Additional Charge Items

From time to time JoeCo, or third parties authorised by JoeCo, may make available software which by reason of third party licensing or specific extra cost of development or other reason, may be subject to additional charges for use. At its sole discretion JoeCo may issue separate licence agreements regarding evaluation or use for such additional charge items. If JoeCo does not issue a separate licence agreement with any additional charge item then the software embodied in that additional charge item will fall under the provisions of this Software Licence Agreement.

4. Limitations of Use

The Software must not be used for any illegal purposes and especially not for any use involving breach of copyright. The Software is not licensed for use in any life-critical application. You acknowledge that the JoeCo Software is not intended or suitable for use in situations or environments where the failure or time delays of, or errors or inaccuracies in, the content, data or information provided by the JoeCo software or services could lead to death, personal injury, or severe physical or environmental damage. Any such use is entirely at the risk of the user and the user must hold JoeCo harmless for any claim arising from such use.

5. Limitations of Liability

You, the User, expressly acknowledge and agree that:

- to the maximum extent permitted by applicable law, use of the JoeCo Software is at your sole risk and that the entire risk as to satisfactory quality, performance and accuracy is with you
- you have evaluated the Software together with the hardware and accepted its suitability for your

application

To the maximum extent permitted by applicable law, JoeCo hereby disclaims all warranties and conditions with respect to the Software and any services performed by use of the Software, either express, implied or statutory, including, but not limited to, the implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.

No oral or written information or advice given by JoeCo or by an authorised JoeCo distributor, reseller or representative shall create a warranty of any kind.

Should the Software prove defective or unsuitable for your application, you will assume the entire cost of all necessary correction, servicing or repair.

Users of JoeCo products who upgrade to this Software from a previous version should note that JoeCo has no requirement to supply free of charge upgrades but does so in the interest of adding additional functionality and improvements for the benefit of its customers. In the event that a change of functionality is made that is not of benefit to you, your sole recourse is to revert to a previous version of the Software as already properly used under licence and accepted for use by you.

In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the User, purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

6. Termination of Licence

This Licence is effective until terminated. Breach of any terms of this Licence by an owner or user of a Product will automatically terminate the Licence. The Licence is also terminated if the Product is returned under warranty or in exchange for a full or partial refund or in exchange or part-exchange for another product. Upon termination you will cease all use of the Software and destroy or return any copies of the Software to JoeCo. Sections 1, 3, 4, 5, 6, 8, 9, 10 and 11 of this Licence shall survive any such termination.

7. Force Majeure

JoeCo will not be liable or responsible for any failure to perform, or delay in performance of, any of its obligations under this Licence that are caused by an event outside of its reasonable control.

8. Waiver

If JoeCo fails, at any time during the term of this Licence, to insist upon strict performance of any of your obligations under this Licence, or if it fails to exercise any of the rights or remedies to which it is entitled under this Licence, this shall not constitute a waiver of such rights or remedies and shall not relieve you from compliance with such obligations. A waiver by JoeCo of any default shall not constitute a waiver of any subsequent default.

No waiver by JoeCo of any of the terms of this Licence shall be effective unless it is expressly stated to be a waiver and is communicated to you in writing.

9. Severability

If any provision of this Licence is found void, invalid or unenforceable, it will not affect the validity of the balance of the Licence, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

10. Entire Agreement

This Licence constitutes the entire agreement between you, the User, and JoeCo relating to the Software and supersedes all prior written agreements and verbal or written undertakings. JoeCo will not be bound by any modification or amendment of this Licence unless it is in writing and signed by JoeCo.
You acknowledge that, in agreeing to the terms of this Licence, you have not relied on any representation, undertaking or promise given or implied from anything said or written by JoeCo or by an authorised JoeCo distributor, reseller or representative prior to entering into this Licence except as expressly stated in this Licence.

In the event that any translation of this Licence (from its original in UK-English language version) is carried out for different countries and there is a dispute between the UK-English and any non UK-English version, the UK-English version of this Licence shall take precedence, to the extent not prohibited by local law in your jurisdiction.

11. Governing Law

This Licence shall be construed, interpreted, and governed by the laws of England. This Licence shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is hereby expressly excluded.

Warranty Information

1. Warranty

Except as specified below, JoeCo Limited (hereinafter referred to as JoeCo) warrants the hardware elements of this JoeCo Product (hereinafter referred to as the 'Hardware') to be free of defects in materials and workmanship for a period of one (1) year for parts and labour from date of original retail purchase, provided that:

- the Product is owned by the original purchaser
- the purchaser has proof of purchase from an authorised JoeCo distributor or reseller
- the purchaser has registered the Product with JoeCo

The following are not covered by the Warranty, damage:

- resulting from abnormal use, misuse, abuse, neglect or accident
- sustained as a result of failure to follow instructions provided in the user manual
- which occurs during shipping, in which case claims must be presented to the carrier
- resulting from attempted repair by anyone other than JoeCo or a JoeCo distributor, reseller or service provider specifically authorised by JoeCo to service JoeCo's Products
- to any Product which has been modified or on which the Product identification details have been altered or removed.

This Warranty:

- gives you specific legal rights, and you may also have other rights in certain countries or states
- provides that, during the Warranty period, JoeCo will, at its sole option, either replace, repair or refund the purchase price of any JoeCo Product that proves to be defective in materials or workmanship on inspection by JoeCo or one of its authorised service providers
- excludes power supplies and cables
- includes labour and materials (except power supplies and cables) but excludes shipping to and from JoeCo or one of its authorised service providers, minimal handling charges and insurance
- is only valid within the country in which the Product was originally purchased
- can only be exercised by the original retail purchaser and cannot be assigned or transferred

- starts from the date of delivery from the JoeCo distributor or reseller to the purchaser
- is extended to the minimum level required by law in those countries or states in which such extension is required by legislation
- applies to a repaired or replacement Product until the end of the period of the original Warranty or thirty days from the date of dispatch of the repaired or replaced Product, whichever is the longer.

2. Claims Under Warranty

To make a claim under Warranty, the purchaser must first call, email or write to JoeCo (see the JoeCo website at www.joeco.co.uk for contact details) to provide a description of the problem and to obtain a Returned Materials Authorisation (RMA) number. If it is determined that the Hardware may be defective, you will be given an RMA number and instructions for returning the Product.
Any Product which is returned to JoeCo or to one of its distributors or resellers without authorisation, i.e. one for which an RMA number has not been issued by JoeCo, will be returned to the purchaser at the purchaser's expense.

After the RMA number is obtained, the Product (including the power supply) should be shipped to the address given by JoeCo in protective packaging (the original packaging if possible) with a description of the problem and proof of Warranty coverage. The RMA number should be clearly written on the package.

Proof of Warranty coverage must be presented in the form of the original dated sales receipt or other positive proof that the Product is within the Warranty period.

When returning goods under Warranty, the purchaser is responsible for shipment and for the risk of loss or damage during shipment. JoeCo therefore recommends that such shipments are fully insured and sent by Registered Post, Recorded Delivery, or via a courier to guarantee receipt.

In the event that JoeCo determines that the Product requires repair because of abnormal use, misuse, abuse, neglect or accident, it will assess a fair repair or replacement fee. The purchaser will have the option (exercisable within thirty days of notification by JoeCo) to pay this fee and have the Product repaired and returned, or not pay this fee and have the Product returned un-repaired at their expense. Thereafter JoeCo reserves the right to dispose of such unrepaired product without further notification.

JoeCo reserves the right to update any Product returned under Warranty.

3. Limitations of Liability

JoeCo specifically disclaims all other warranties. The Warranty contained herein supersedes any other warranties or representations whether express or implied or otherwise, with respect to the Product, and specifically excludes any implied warranties and/or conditions of merchantability, satisfactory quality, fitness for a particular purpose, accuracy, non-infringement of third party rights or other implied warranties or conditions.
The remedy for breach of this limited Warranty shall not include any other damages. In no event will JoeCo be liable for incidental, consequential, special, indirect or other damages or claims, even if its agents have been advised of the possibility of such damages, resulting from the breach of any express or implied warranty. Such damages may include but are not limited to the following:

- any loss of profit or any other commercial damage
- partial or total loss of data incurred whilst using the Product
- the cost of recovery of lost data
- inability to use or to continue to use the Product itself or any connected device
- damage to property
- damage based on inconvenience, loss of time or interrupted operation

and, to the extent permitted by law, damages for personal injury.

In no event will JoeCo's liability for any damages to the purchaser or any other person exceed the price paid for the Product, regardless of any form of the claim.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so some of the above limitations or exclusions may not apply to you.

4. Product Changes and Improvements

JoeCo reserves the right to change or improve the design of its products at any time without prior notice.

5. Force Majeure

JoeCo will not be liable or responsible for any failure to perform, or delay in performance of, any of its obligations under this Warranty that are caused by an event outside of its reasonable control.

6. Waiver

If JoeCo fails, at any time during the term of this Warranty, to insist upon strict performance of any of your obligations under this Warranty, or if it fails to exercise any of the rights or remedies to which it is entitled under this Warranty, this shall not constitute a waiver of such rights or remedies and shall not relieve you from compliance with such obligations.
A waiver by JoeCo of any default shall not constitute a waiver of any subsequent default.

No waiver by JoeCo of any of the terms of this Warranty shall be effective unless it is expressly stated to be a waiver and is communicated to you in writing.

7. Severability

If any provision of this Warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the Warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

8. Entire Warranty

This Warranty constitutes the entire warranty provided to you by JoeCo and supersedes all prior written agreements and all representations, undertakings and promises given or implied by anything said or written by JoeCo or by an authorised JoeCo distributor, reseller or representative. JoeCo will not be bound by any modification or amendment of this Warranty unless it is in writing and signed by JoeCo.
In the event that any translation of this Warranty (from its original in UK-English language version) is carried out for different countries and there is a dispute between the UK-English and any non UK-English version, the UK-English version of this Licence shall take precedence, to the extent not prohibited by local law in your jurisdiction.

9. Jurisdiction

This Warranty shall be construed, interpreted, and governed by the laws of England. This Warranty shall not be governed by the United Nations Convention on Contracts for the International Sale of Goods, the application of which is hereby expressly excluded.

Product Returns

To return any JoeCo Product, the purchaser must first call, email or write to JoeCo (see the JoeCo website at www.joeco.co.uk for contact details) to obtain JoeCo's agreement to the return and a Returned Materials Authorisation (RMA) number. JoeCo will issue an RMA and instructions for returning the Product if it agrees that:

- the Product can be returned,
- an incorrect Product has been delivered,
- the Product is faulty and covered by warranty (see Warranty Information), or
- the Product is capable of being repaired if outside warranty

Please note that any Product returned due to incorrect delivery must be in a resalable condition to receive a credit note.

Any Product which is returned to JoeCo or to one of its distributors or resellers without authorisation, i.e. one for which an RMA number has not been issued by JoeCo, will be returned to the purchaser at the purchaser's expense.

After the RMA number is obtained, the Product should be shipped to the address provided by JoeCo in protective packaging (the original packaging if possible) with a note giving the reason for the return. The RMA number should be clearly written on the package.

When returning goods, the purchaser is responsible for shipment and for the risk of loss or damage during shipment. JoeCo therefore recommends that such shipments are fully insured and sent by Registered Post, Recorded Delivery, or via a courier to guarantee receipt.

Where a Product is returned for repair outside warranty, JoeCo will inspect the Product and provide the purchaser with an estimated fee for repair. The purchaser will have the option (exercisable within thirty days of notification by JoeCo) to pay this fee and have the Product repaired and returned, or not pay this fee and have the Product returned un-repaired at their expense. Thereafter JoeCo reserves the right to dispose of such unrepaired product without further notification.

JoeCo reserves the right to update any Product returned for repair.

Product and End User Registration

It is recommended that you register yourself as an end user of the BlackBox Recorder product on the JoeCo website at your earliest opportunity. This completes your warranty registration, allows you access to software updates which JoeCo may release from time to time and a lot of additional information.

To register as an End User please go to the JoeCo website www.joeco.co.uk and select the **Log In** button to the right-hand side of the blue menu bar. Once in the Log In area, select the New Registration Link and fill out your details. It is important to fill out all your details including the full model and serial number of your BlackBox Recorder. If all you need at the moment is documentation, register as a visitor initially – it's quicker – and then upgrade to an EndUser later.

Once your registration has been submitted it will be forwarded to JoeCo personnel who will need to approve your application before issuing you with a password.

JoeCo can only provide support for the current release of software. It is therefore imperative that you download and use the latest software release

We hope you enjoy using your BlackBox Recorder – we certainly have enjoyed designing it!